

servers since the year 1594, with special descriptions of the more important auroral displays and a general analysis of the reports. As it seemed likely that there would be a long delay in the publication of this important work, the summaries given by Tromholt in this preliminary communication were extremely welcome. My personal interest in the matter even led me to offer to supervise the publication in America of the original work, since the author had failed to find a publisher in Europe, but his early death closed our negotiations in this respect and it appears that his manuscript was subsequently given by his widow to his friend J. Fr. Schroeter for the purpose of publication in Norway, if possible. This desire has now been realized, and the publication at the joint expense of the Academy of Sciences at Christiania and the Fridtjof-Nansen Fund, as recommended by Professor Dr. Mohn, is a valuable addition to our knowledge of the aurora borealis.

This volume is a quarto of 422 pages of text besides the preface. In addition to the preface by Schroeter, there is also one prepared by Tromholt, from which we learn that he began the work of making this collection in 1879 and did not shrink from the great labor of examining general historical and archaeological works, public and private libraries, and the archives of about a dozen public institutions, including the university library at Leipsic. Especial attention was given to Norwegian newspapers. In all cases the complete records of details were copied. The dates are always reckoned, as in astronomy, from noon to noon; the four subdivisions of Norway are: I, north of $68^{\circ} 30'$; II, between $68^{\circ} 30'$ and 65° ; III, between 65° and $61^{\circ} 30'$; IV, south of $61^{\circ} 30'$. The total number of stations from which observations have been gathered is 216 and the total number of sources of information referred to in the catalogue is about 300.

Under the editorship of Schroeter, the material collected by Tromholt has been judiciously sifted and apparently nothing has been published that is not a distinct addition to exact knowledge. Especially must we approve of Schroeter's good judgment as an editor in restricting the publication of detailed descriptions, partly because so many are given in the publications of the International Polar Research, 1882-83, by expert physicists that nothing more would seem to be necessary; partly because there is abundant reason to think that the same aurora presents different aspects to observers a few miles apart, so that the mass of details must be useless until we understand more about the location and origin of the phenomena.

The list of auroras (Catalogue D) begins with September 27, 1594, and ends with April 22, 1878, covering 310 pages, and giving about 9 000 observations on nearly 6 000 different auroral dates. For each date is given the age of the moon, the place and time of observation, a few words of description, and a reference to the source of information. In the second section, special descriptions are given of suspected auroras, from 1550 to 1569, and of auroras proper from 1739 to 1878. In the third section, Table A gives the monthly and annual sums of the days on which auroras were observed somewhere in Norway. The auroral year, like the snow year, is reckoned from July to June, inclusive. The annual sums are then transformed into smoothed numbers by the formula $1/10 (a + 2b + 4c + 2d + e)$. The annual sums are also given for each of the four sections into which the author subdivides the area of Norway. On page 352 these annual sums, from 1761 to 1878, are combined into one total, representing the monthly distribution of 5 891 days with auroras. This computation is given for each of the four subdivisions, as well as for all Norway. The monthly sums are also converted into comparable percentages by reduction to a uniform summation of 1 000, whence it appears that in the northernmost division of Norway the annual periodicity shows a maximum at the winter solstice, whereas in the southernmost section two maxima occur corresponding to the equinoxes. Therefore, in the northern

portion of Norway the annual periodicity is of the same character as in the arctic regions generally. The annual period prevailing in the southern division of Norway is similar to that found in all middle latitudes. A combination of all the records of Tromholt for Norway, and Rubenson for Sweden, is given on pages 353-414, for the years 1722, March 4, to 1878, April 22. The study of the geographical distribution of these observations shows again a maximum in January in the northern regions, and maxima about September 21 and March 21 in the southern regions.

In the third part of the volume Schroeter has presented us with a new and complete recomputation of the preliminary discussion found among the papers of Tromholt, so that the figures differ somewhat from those published by the latter in Petermann's Mittheilungen. Especially has he omitted the attempt to investigate the apparent periodicity of the aurora due to the obscuration by the varying brightness of the moon, since such an investigation can not lead to any satisfactory result, unless the cloudiness of the sky has been recorded uniformly throughout many lunar months. For the same reason the study of the annual periodicity must be omitted, but we do not at first see why a similar argument would not hold good against the investigation of the sun-spot period which Schroeter has undertaken. Notwithstanding the imperfections of his data, Schroeter concludes that the results for Norway are in general quite parallel to those deduced by Rubenson from the observations in Sweden.

It is not likely that this great work of Tromholt's, taken in conjunction with its predecessors, exhausts all accessible European records, but it goes a long way toward preparing for a renewal of the comprehensive studies of the geographical and chronological distribution of auroras that were initiated by Fritz fifty years ago.—C. A.

MARYLAND CLIMATOLOGY.

Dr. O. L. Fassig communicates to the Library of the Weather Bureau copies of the short paper on the climate of Cecil County, Md., just now published as a part of the volume of the Maryland Geological Survey on the Geology of Cecil County. A third pamphlet on the climate of Garrett County is now in press. A similar report on Allegheny County was published in 1900. The plan is to take up each county of the State in turn and tabulate and discuss all the meteorological observations that have been made at any time in the history of the county, but especially those made under the auspices of the Smithsonian Institution, 1848-1873, the Weather Bureau, 1870-1902, and the Maryland State Weather Service, 1896-1902. The expense of publication is met by the Maryland Geological Survey. Each climatic sketch forms a chapter in the volume on the geology of the respective counties. In this way the local peculiarities of each portion of the State will be thoroughly presented.

Cecil County is in the extreme northeast section of the State of Maryland. Its surface is most gently undulating with a general elevation of about 300 feet, but occasionally rising to 500. The tide waters of Chesapeake Bay penetrate every portion of the southern part of the county. The principal records discussed in this pamphlet are those of Woodlawn from 1865 to 1875, inclusive, at which station the maximum temperature of 100° occurred once, in July, 1868, and the minimum temperature of -10° , also once, in January, 1873. The maximum monthly precipitation was 11.81, in August, 1874, and minimum monthly was 0.36, in October, 1875.—C. A.

WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. J. R. Weeks, Observer, United States Weather Bureau, Macon, Ga., reports that he gave an informal lecture on the